

CITY COUNCIL RETREAT

CITY COUNCIL RETREAT
THURSDAY
SEPTEMBER 30, 2021

CORE SERVICES FACILITY
3200 WEST ROUTE 66
8:30 A.M.

ATTENTION

IN-PERSON AUDIENCES AT CITY COUNCIL MEETINGS HAVE RESUMED WITH LIMITED CAPACITY

The meetings will continue to be live streamed on the city's website
(<https://www.flagstaff.az.gov/1461/Streaming-City-Council-Meetings>)

PUBLIC COMMENT

WE ARE NO LONGER USING TELEPHONE COMMENTS

All verbal public comments will be given through a virtual public comment platform

If you want to provide a verbal comment during the Retreat, use the link below to join the virtual public comment room.

VIRTUAL PUBLIC COMMENT

Written comments may be submitted to publiccomment@flagstaffaz.gov. All comments submitted via email will be considered written comments and will be documented into the record as such.

AGENDA

1. Call to Order

NOTICE OF OPTION TO RECESS INTO EXECUTIVE SESSION

Pursuant to A.R.S. §38-431.02, notice is hereby given to the members of the City Council and to the general public that, at this work session, the City Council may vote to go into executive session, which will not be open to the public, for legal advice and discussion with the City's attorneys for legal advice on any item listed on the following agenda, pursuant to A.R.S. §38-431.03(A)(3).

2. Pledge of Allegiance and Mission Statement

MISSION STATEMENT

The mission of the City of Flagstaff is to protect and enhance the quality of life for all.

3. ROLL CALL

NOTE: One or more Councilmembers may be in attendance telephonically or by other technological means.

MAYOR DEASY
VICE MAYOR DAGGETT
COUNCILMEMBER ASLAN
COUNCILMEMBER MCCARTHY

COUNCILMEMBER SALAS
COUNCILMEMBER SHIMONI
COUNCILMEMBER SWEET

4. Welcome and Introductions

**5. Infrastructure Retreat - Morning Session
Presentation and Discussion**

- Wastewater Infrastructure
- Stormwater Infrastructure

6. Public Comment

**7. Infrastructure Retreat - Afternoon Session
Presentation and Discussion**

- Bicycle Infrastructure
- Public Safety Infrastructure

8. Public Comment

9. Adjournment

CERTIFICATE OF POSTING OF NOTICE

The undersigned hereby certifies that a copy of the foregoing notice was duly posted at Flagstaff City Hall on _____, at _____ a.m./p.m. in accordance with the statement filed by the City Council with the City Clerk.

Dated this _____ day of _____, 2021.

Stacy Saltzburg, MMC, City Clerk

**CITY OF FLAGSTAFF
STAFF SUMMARY REPORT**

To: The Honorable Mayor and Council
From: Stacy Saltzburg, City Clerk
Date: 09/27/2021
Meeting Date: 09/30/2021



TITLE

Infrastructure Retreat - Morning Session

STAFF RECOMMENDED ACTION:

Presentation and Discussion

- Wastewater Infrastructure
- Stormwater Infrastructure

EXECUTIVE SUMMARY:

INFORMATION:

Attachments: [Detailed Agenda](#)
[Wastewater Infrastructure Presentation](#)
[Stormwater Infrastructure Presentation](#)

City Council Infrastructure Retreat

September 30, 2021

Detailed Agenda

Time	Topic	Staff
8:30 am	Welcome and Objectives	Greg Clifton Nicole Lance
8:45 am	Wastewater Infrastructure	Andy Bertelsen
10:30 am	Break	
10:45 am	Stormwater Infrastructure	Brad Hill John Ruetten Brian Bernard Jim Huchel Nicole Antonopoulos
12:30 pm	Public Comment	
12:45 pm	Lunch	
1:15 pm	Regroup/Refocus - Introduction of New Topics	Nicole Lance
1:30 pm	Bicycle Infrastructure	Martin Ince
2:45 pm	Break	
3:00 pm	Public Safety Infrastructure	Chief Gaillard Chief Musselman
4:00 pm	Public Comment	
4:15 pm	Wrap Up and Adjourn	Nicole Lance Greg Clifton Mayor Deasy

Please note: All times are estimates and items could be reordered during the meeting

City of Flagstaff
Council Retreat Presentation
Wastewater Treatment
Briefing





Today's Topics



1. Wastewater Treatment Objectives and Standards
2. Flagstaff Water Reclamation Plants
3. History of Wildcat Hill Plant
4. Wildcat Hill Plant Issues, Urgency
5. Wildcat Hill Solids Treatment and Handling Improvements
6. Options for Increasing Wildcat Hill Hydraulic Capacity
7. Future Updates, Discussions



Wastewater Treatment Objectives and Standards

Topic 1



2025 Strategic Plan

SUMMARY OF STRATEGIC OBJECTIVES - The Objectives in this Plan address the following important issues:

1. Use Standards and Data to Drive Decision Making
2. Address Wildcat Hill Water Reclamation Plant Capacity
3. Protect the Water System for Wildfire Threat
4. Upgrade Stormwater System and Increase Maintenance
5. Accelerate Infrastructure Maintenance and Replacement
6. Ensure Adequate Water Resources and Plan for Climate Change
7. Maintain Excellent Water Quality
8. Improve Compliance with Environmental Standards and Protections
9. Enhance Communications and Customer Service
10. Address Critical Workforce Issues





Wastewater Treatment Objectives and Standards

Topic 1



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10. Address Critical Workforce Issues

Wastewater Standards

- Meet or surpass all Clean Water Act standards
- Maintain public and environmental health during fires, storms, power losses, and pandemics
- Extremely low risk of failures that increase potential periods of non-compliance and environmental impacts
- Adhere to principles of sustainability and the provisions in the Flagstaff Carbon Neutrality Plan
- High efficiency, specifically related to operations, staffing, and energy use
- Safe, collaborative, and collegial workplace
- Employees certified, highly trained, motivated, and empowered



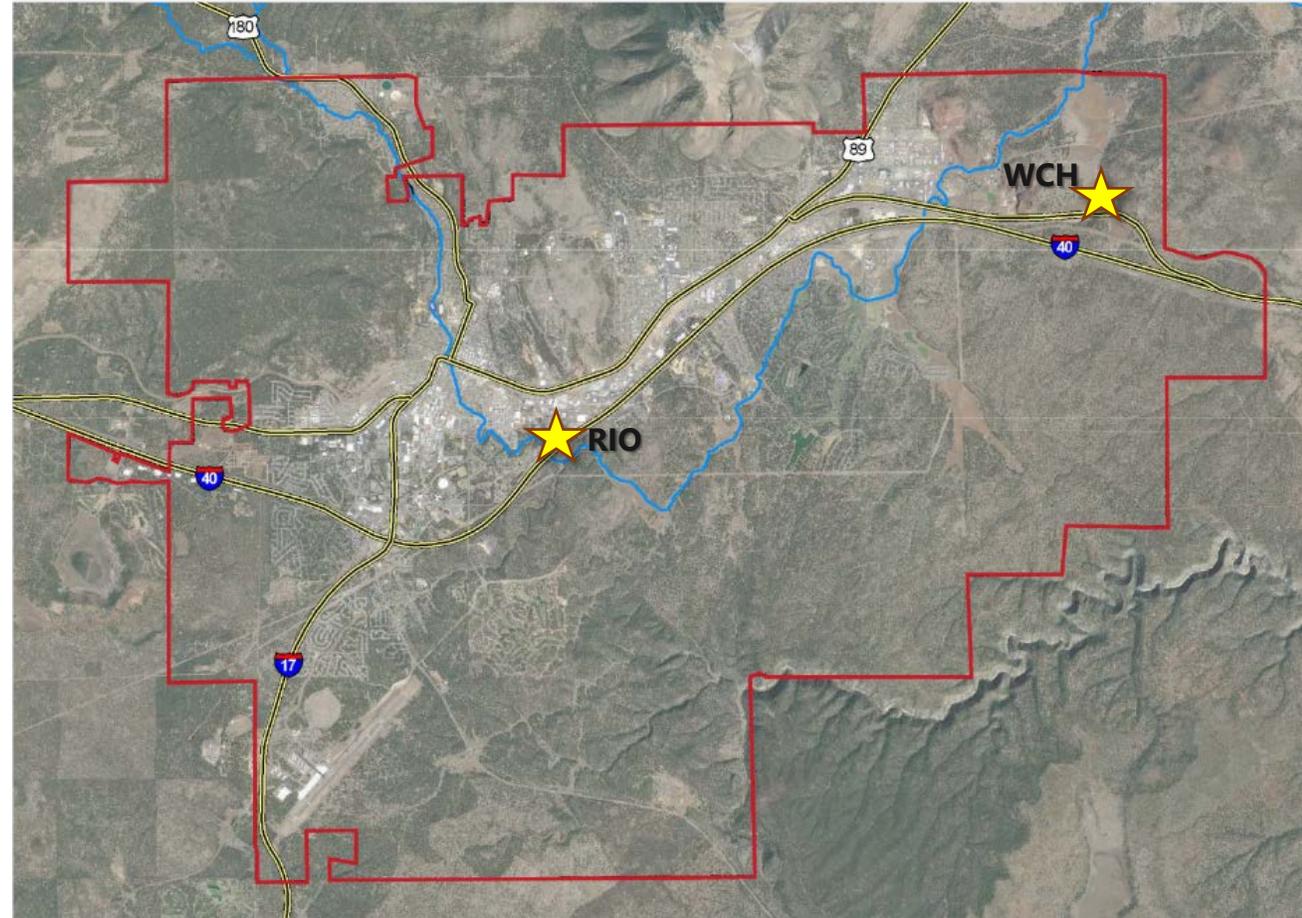
Flagstaff Water Reclamation Plants

Topic 2



1. **Wildcat Hill (WCH)** – End of the Line Plant Rated at 6.0 Million Gallons per Day (MGD) liquids and biosolids capacity
2. **Rio De Flag (RIO)** – Satellite Plant Rated at 4.0 Million Gallons per Day (MGD) liquids capacity

The biosolids from Rio De Flag are sent via the wastewater system to the Wildcat Hill Plant for treatment



RIO and Wildcat Hill Location Map

History of Wastewater Treatment in Flagstaff

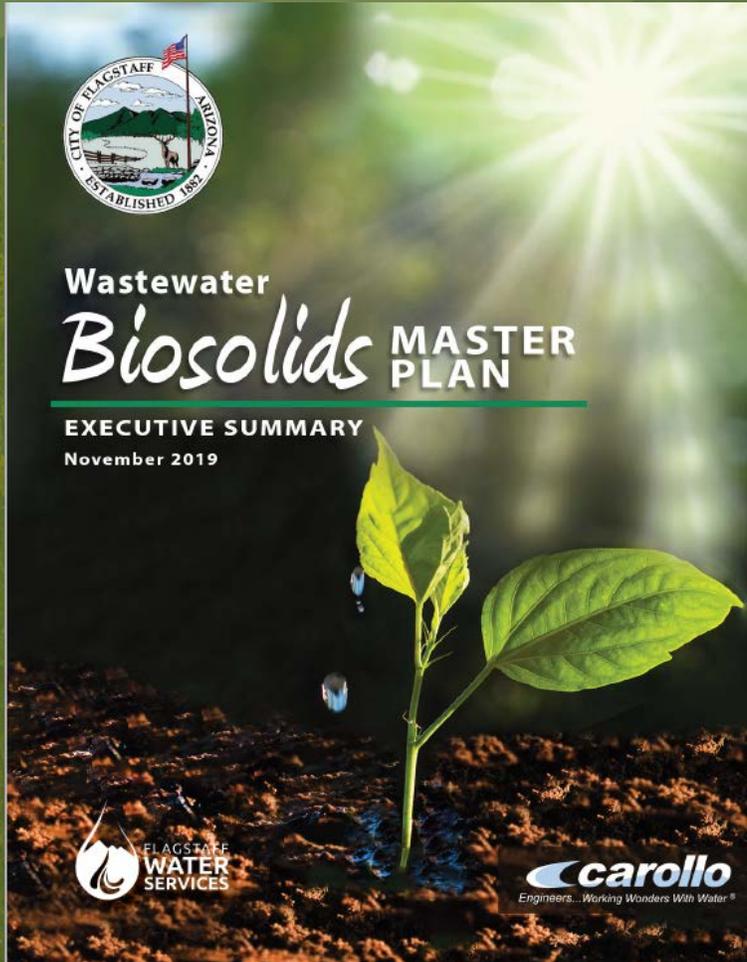
Topic 3



- 1971 – Wildcat Hill constructed at 3 MGD
 - ✓ Class B reclaimed water is produced and delivered to Continental Country Club
 - ✓ Biosolids are disposed on-site
- 1981 – Wildcat Hill expanded to 6 MGD
- 1993 – Constructed Rio Water Reclamation Plant (4 MGD, Class A+ reclaimed water)
- 2009 – Wildcat Hill treatment upgraded to Class A+ reclaimed water
 - ✓ No liquids or biosolids capacity expansion
 - ✓ Only portions of the plant were upgraded
- 2013 Consent Order – Temporary Solutions

2019 Master Plan Rio and Wildcat Hill Plants - Topic 3

- Liquids and Solids Capacity
- Plant Condition Assessments
- Current and Future Regulations
- Expansion and Treatment Technology Recommendations
- Conceptual Plant Layouts
- Costs of Capital Improvements





Wildcat Hill Wastewater Trends

Topic 3



Liquid Flow and Solids Loading Changes Since 2008

- Water conservation decreasing per person wastewater flows
 - ✓ Gallons Per Day Per Person (GPCD) dropped 18% (84 GPCD to 69 GPCD)
- Flagstaff population grew by more than 16%
- Plant inflow has decreased by 6%...solids loading has increased by 30%
- **Net Result** – Wildcat Hill no longer 6 MGD plant, **now 4.8 MGD**

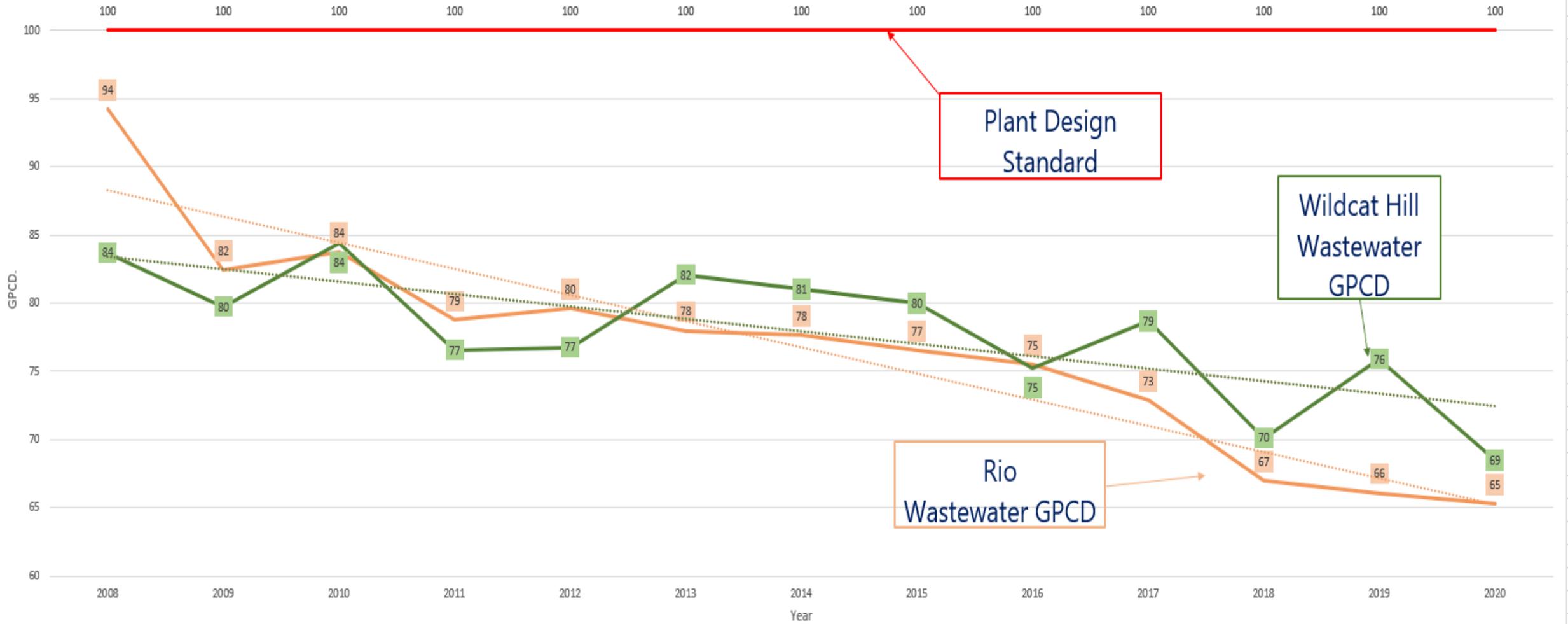


Water Conservation Effect on Wastewater Strengths

Topic 3



Conservation Efforts VS Plant Design Standard





Wildcat Hill Water Plant Issues, Urgency



Topic 4

- Solids Treatments Capacity is at **88 %**
- Liquids Treatment Capacity is at **87%**
- Redundancy
 - ✓ Multiple Single Points of Potential Failure
 - ✓ Limited Operational and Mechanical Flexibility
- Rehabilitation and Replacement
 - ✓ Budget Constraints
 - ✓ Lack of Redundancy to Make Repairs
- Peak Flow Events Increasing Due to Climate Change (3X Daily Flows)

2014 Utilities Integrated Master Plan Policy F3.1:

- ✓ 75% of flow capacity = identify additional capacity and funding
- ✓ 80% of flow capacity = begin design for increased capacity.
- ✓ 85% of flow capacity = begin construction of expanded facilities.
- ✓ 95% of actual flow capacity = completed construction

Wastewater Inflow Impacts:

- ✓ Enforcement of Industrial Permits
- ✓ Conservation, Lower Flows



Solids Treatment and Handling at Wildcat Hill



Topic 5

- Two New Digesters
 - ✓ Design funded in FY2022 wastewater capital program
 - ✓ Construction partially funded in FY2022/24, estimated to be completed in 2024
- Solids Dewatering and Handling - Funded in FY 2023-2025
- Solar Drying (Class A Biosolids - Green Energy) – Funded in FY2025-2027
 - ✓ Alternate disposal options (landfill cover, mulch, etc.)
- Rehabilitation and Replacement
 - ✓ Refurbishing existing (2) digesters – After new digesters are completed
 - ✓ Keeping the solids treatment and handling processes operational



Option 1 – Phased Expansion (Staff Recommendation)

- Fund new treatment plant at 6 Million Gallons per Day (~\$150M)
 - ✓ Provides new capacity for growth and incorporates redundancy
 - ✓ Adaptive management - right size, right time, future technology
 - ✓ Foundation for implementing advanced treatment – Indirect Potable Reuse (IPR), Direct Potable Reuse (DPR), and addressing Constituents of Emerging Concern (CECs)
- Continue to operate Wildcat Hill at 6 MGD until next expansion (+/- 20 years)
 - ✓ Fund repair and replace of existing plant - ~\$30M
- Total Cost - ~\$180M (today's costs)



Wildcat Hill – Liquids Treatment Capacity



Topic 6

Option 2 – Single Expansion

- Fund new treatment plant at 12 Million Gallons per Day (~\$300M?)
 - Provides new capacity for growth and incorporates redundancy
 - Foundation for implementing advanced treatment – IPR, DPR, and addressing CECs
- Retire Wildcat Hill (+/- 7 years)
 - Fund repair and replace of existing plant - ~\$13M
- Total Cost - \$313M (today's cost)



Future Updates, Discussions

Topic 7



- Wildcat Hill Site Expansion - Options 1 or 2
 - ✓ Capital costs, timeframes, and extending life of the current plant
- Sustainability Issues
 - ✓ Continuing assessment of climate change impacts
 - ✓ Integration of Carbon Neutrality Plan provisions
- Reclaimed Water Considerations
 - ✓ Urgency/timeframes for developing unused reclaimed water
 - ✓ Treatment requirements for IPR or DPR uses if applicable
 - ✓ Addressing CECs



Future Updates, Discussions

Topic 7



- Advancing the Carbon Neutrality Plan – what’s possible
 - ✓ Opportunity to pursue environmentally sound biosolids practices that go beyond regulatory compliance requirements
 - ✓ Biosolids to biochar
 - ✓ Organic waste and biosolids to biochar
 - ✓ Biosolids to energy
 - ✓ Biosolids to hydrogen
 - ✓ Opportunity to develop Carbon Dioxide Removal (CDR) initiatives
 - ✓ CDR campus across from Wildcat Wastewater Treatment Facility

Questions?



City of Flagstaff
Council Retreat Presentation

Stormwater Infrastructure Briefing

A 2021 Assessment





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Stormwater in Flagstaff: Current Projects and Future Options



Current Capital Projects

from 5-year Capital Plan, focused on:

- Rio De Flag Flood Control Project
 - Side Laterals/Improvements that connect to Rio De Flag
 - Spot Improvements – Annual Allocation
 - ✓ Dedicated to ongoing drainage issues
- **Funded through current (2019) stormwater rate fee**
- \$3.74 per Equivalent Runoff Unit - ERU (1500 sq ft impervious surface)
 - Projects identified in 2007-2010 Northeast Area Master Drainage Study (NEAMDS)



Current Capital Projects

FY22 Projects, Prioritized Annually:

- Phoenix Ave Bridge (underway in 2021)
- Linda Vista Culvert at Spruce Wash (completed in 2020)
- Rio De Flag Lateral – Santa Fe Ave.
- Rio De Flag Lateral – Malpais (Clay Wash)
- Columbia Circle ~ replaced with Steve's Wash at Soliere Ave. (early 2020)
- Rio De Flag Lateral – Downtown
 - ✓ A 2021 FEMA BRIC grant application was denied as uncompetitive
- Fanning Wash at Route 66

FY22 Stormwater Capital Budget

\$8.3 Million

Includes Annual Base
Budget Allocation of

\$700,000 for
Improvements

and Rio De Flag projects



- **Spruce Wash** (Museum Fire response)
 - ✓ Dortha Channel Improvements
 - ✓ Killip Detention Basin- design
 - ✓ Channel improvements
 - **FY22 \$1.8 Million**
- **Rio De Flag Projects and related Laterals**
 - **FY22 \$4.2 Million**
- **Other Projects, Reserves**
 - ✓ Phoenix Bridge
 - ✓ Spot Improvements
 - **FY22 \$2.3 Million**

➤ **No funding for other watersheds**



What Changed? Summer 2021



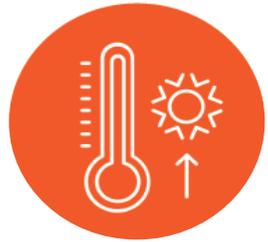
First True Monsoon Season Since 2019 Museum Fire

- **Flooding from Museum Burn Scar**
 - ✓ Two years of record dry summers
 - ✓ Four large flood events in Summer 2021
 - ✓ Ongoing flood threat exists downstream of the burn area
- **200-year Rain Event on south side of Mt. Elden**
 - ✓ Event incised mountain slopes and channels
 - ✓ Upper and lower Fanning Wash now at greater risk
 - ✓ Damage to watershed and city infrastructure

Climate Change in Flagstaff



Compared to today, by 2050, on average we can expect to see...



- Hotter temperatures.
- Increased aridity and more severe drought conditions.



- Less snowpack.
- More precipitation as rainfall instead of snowfall.



- Increased wildfire risk.

Climate change will have cascading impacts in our community from health to housing.



Water



Land Use & Housing



Tourism & Economy



Health

Vulnerabilities: Water Supply, Quality, & Infrastructure



AVAILABILITY

**HIGH
VULNERABILITY**



Reduced water availability and increased demand could cause water shortfalls.

QUALITY

**MEDIUM-HIGH
VULNERABILITY**



More wildfire, drought, and flooding are likely to impair water quality.

INFRASTRUCTURE

**HIGH
VULNERABILITY**



More wildfire and flooding are likely to significantly damage natural and human-made water infrastructure.



Options - Museum Fire Flood

Option 1. Continue Annual Response

- ✓ Potentially **\$1.8 million annually** in clean-up response, or **\$18 million** over 10 years.

Option 2. Spruce Channel Improvements

- ✓ Improvements to existing infrastructure footprint at **\$12-\$18 million**

Option 3. New Stormwater infrastructure

- ✓ Add 6-8 ft dia. pipe/tunnel, running parallel to existing wash at **\$10-\$30 million**



Current Options - Museum Fire Flood

Option 1. Continue Annual Response

- The Summer 2021 Flood Cleanup cost \$1.8 million
 - ✓ The burn scar in Spruce Watershed will take **10 years** (or more) to heal, potentially costing **\$18 million** reacting to flood events
 - ✓ This doesn't include recurring private damage, indirect community costs or County costs (sandbags)
- **Actual costs may be significantly higher.**





Current Options - Museum Fire Flood

Option 2. Spruce Channel Improvements

- **\$12-18 million** in improvements within existing Stormwater infrastructure footprint, from Paradise Rd to Route 66
 - Add enhancements to existing infrastructure
 - Increase flow capacity through the city
 - Minor adjustments to Stormwater footprint
- Upstream channel detention and retention projects must occur to attenuate flows to city's design flow capacity



Current Options - Museum Fire Flood

Option 2. Spruce Channel Improvements *(existing footprint)*

• Spruce Channel Master Plan Development	\$ TBD
• Paradise Channel Improvement	\$ 140,000
• Park Way area detention/retention	\$ 3,000,000
• Linda Vista culvert improvement	\$ 1,000,000
• Cedar culvert improvement	\$ 1,000,000
• Dortha Inlet improvement	\$ 800,000
• Arroyo Seco Diversion	\$ 1,000,000
• Killip School Detention Basin	\$ 4,600,000
• Channel Improvements (various)	\$ 600,000

- **Estimated Range, with inflation and contingency: \$12-18 million**
- **Does not include Forest Service/Flood Control District coordination**



Future Options - Museum Fire Flood

Option 3. New Stormwater Infrastructure *(new footprint)*

- Future need, based on re-evaluation of Master Plan
- A long-term strategy for post-fire flow mitigation
- Provide additional capacity beyond improvements to existing channel alignment
- Would work in **tandem with Option 2**, Improvements to Existing Infrastructure
- Cost: Without design input, likely **\$10- \$30 million**
 - **Effectiveness is uncertain based on changes in watershed condition, climate change and future storm intensity.**



Museum Fire - Discussion

Review Options:

Option 1. Continue Annual Response

- ✓ Potentially **\$1.8 million annually** in clean-up response, or **\$18 million** over 10 years.

Option 2. Spruce Channel Improvements

- ✓ Improvements to existing infrastructure footprint at **\$12-\$18 million**

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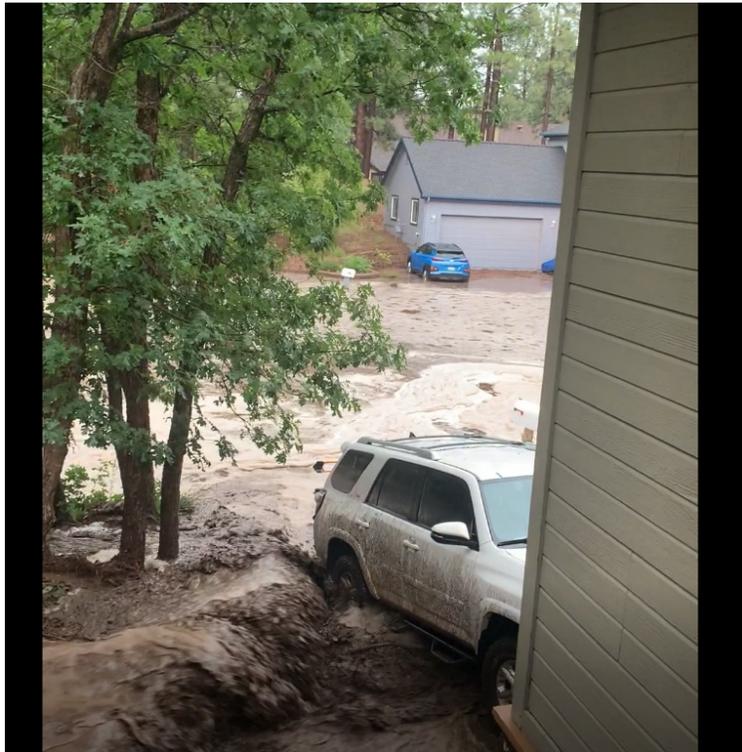
Questions or Direction on Museum Fire/Flood?



Mt. Elden Drainage Issues

Damage to Fanning Wash and in Appalachian and Shadow Mountain neighborhoods

- Rain events created newly-incised channels, which efficiently directed flows into these neighborhoods



- **Flooding caused greater damage in these neighborhoods than the 2021 Museum Fire scar, as social media recorded cars floating downstream**



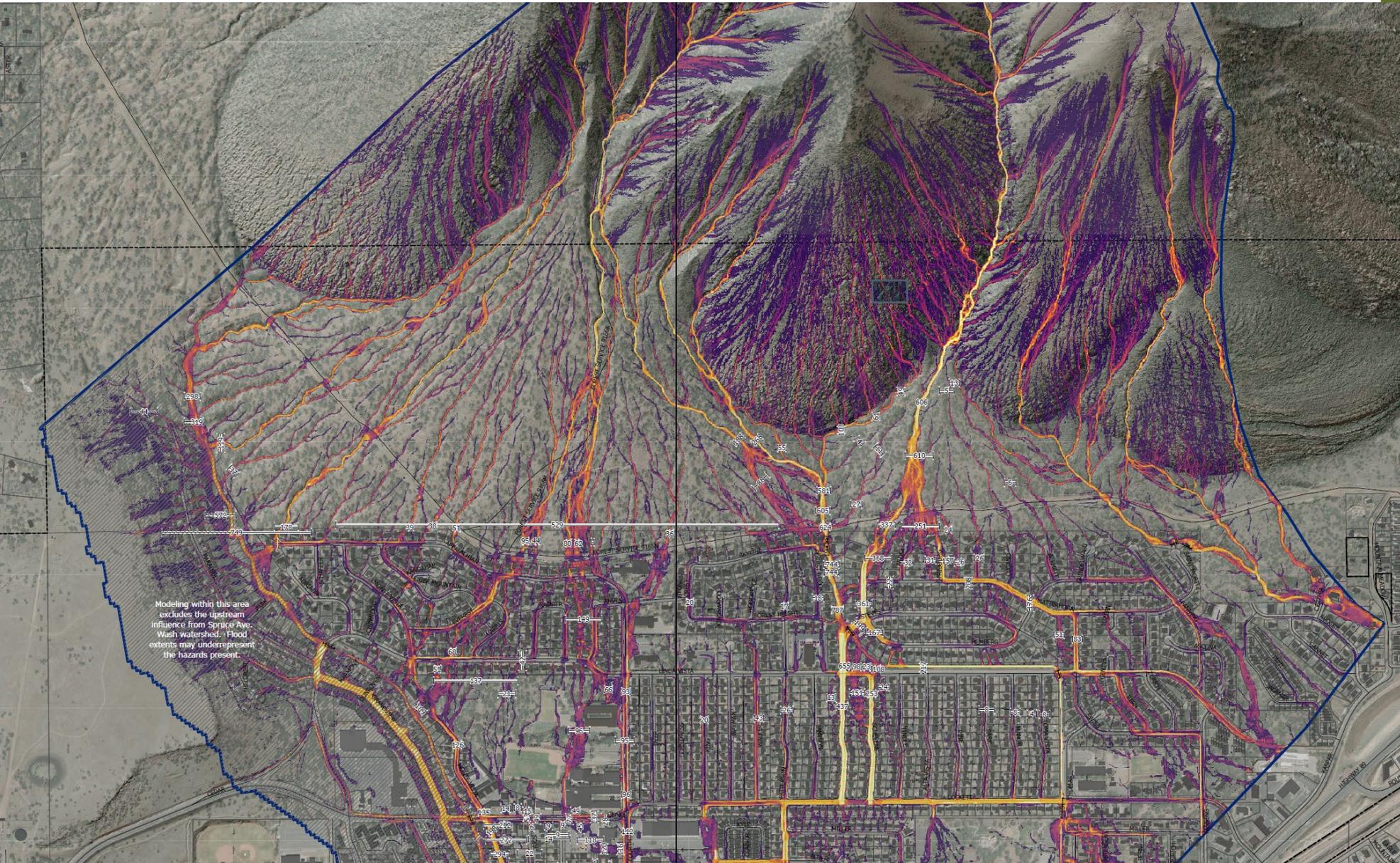
Mt. Elden Drainage Issues



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Drainages south
of Mt. Elden

Hydrologic
model created
shortly after
flood events



Modeling within this area
excludes the upstream
influence from Spruce Ave.
Wash watershed. Flood
extents may underrepresent
the hazards present.



Current Options – Mt. Elden Drainage

Mitigation Costs

- **Detention basin on Pipeline property**
 - ✓ Mitigates flooding through Shadow Mountain neighborhood
 - ✓ Cost: \$2.9 million
- **Channel diversion on Pipeline property**
 - ✓ Mitigates flooding of Appalachian Dr. and Monte Vista Dr.
 - ✓ Cost: \$830,000
- **Fanning Wash improvements**
 - ✓ Needed to mitigate Steve's Blvd, Hemberg Dr. and Route 66
 - ✓ Cost: Unknown, likely \$2 million range



Stormwater Budget Summary

CIP and Maintenance

- **CIP annual budget**..... approximately \$700,000
- **Maintenance budget**..... approximately \$300,000
 - 33% open channel, 66% closed system
- **Additional funding needs:**
 - ✓ Museum Fire mitigations: **\$18M – Option 1 or Option 2** (CIP)
 - ✓ Mt. Elden mitigations: **\$6M** (CIP)
 - ✓ Additional maintenance: **\$80,000/year** in additional maintenance
 - ✓ Long-term Museum Fire funding -**Option 3: \$10-\$30M** (estimate)

Stormwater Infrastructure Briefing

Council Budget Retreat
September 30, 2021



Questions ?

Financial Considerations Water Services





Financial Considerations

Wastewater and Stormwater Needs

- Wildcat Hill Funding - Options 1 or 2
 - \$45+ Million for 5-Year Plan
 - \$135-\$268 + Million to complete Option 1 or 2
- Stormwater
 - Post wildfire flood mitigation – Museum fire flood area
 - \$12-18 Million over next 5 years
 - Mt Elden Drainage Mitigations
 - \$6 Million over next 5 years
 - Additional annual maintenance needs: \$80,000



Financial Considerations



Type of Funding (no priority order)	Wastewater (\$180-\$313M)	Stormwater (\$25M)
User Fees/Pay as you go <ul style="list-style-type: none"> Increase user fees to fund projects 	Yes	Yes
Capacity Fees – Growth related portion only <ul style="list-style-type: none"> Increase capacity fees to fund 	Yes, Partially	No
Debt Financing (Revenue Bonds/Water Infrastructure Loans) <ul style="list-style-type: none"> May need User Fee and/or Capacity Fee increases 	Yes, may require change in policy	Yes, may require change in policy
Federal and/or State Funding <ul style="list-style-type: none"> Future federal infrastructure bills 	Yes	Yes
Re-prioritize existing capital equipment and project	Maybe some, but not enough	Maybe some, but not enough
General Obligation Bonds – Secondary Property Tax <ul style="list-style-type: none"> Possible for November 2022 election (or later) 	Yes	Yes
General Fund Support	Yes	Yes
Sales Tax – Possible future election	Yes	Yes

Questions?



**CITY OF FLAGSTAFF
STAFF SUMMARY REPORT**

To: The Honorable Mayor and Council
From: Stacy Saltzburg, City Clerk
Date: 09/27/2021
Meeting Date: 09/30/2021



TITLE

Infrastructure Retreat - Afternoon Session

STAFF RECOMMENDED ACTION:

Presentation and Discussion

- Bicycle Infrastructure
- Public Safety Infrastructure

EXECUTIVE SUMMARY:

INFORMATION:

Attachments: [Bicycle Infrastructure Presentation](#)
[Public Safety Infrastructure Presentation](#)

Separated Bicycle Lane Infrastructure





Agenda



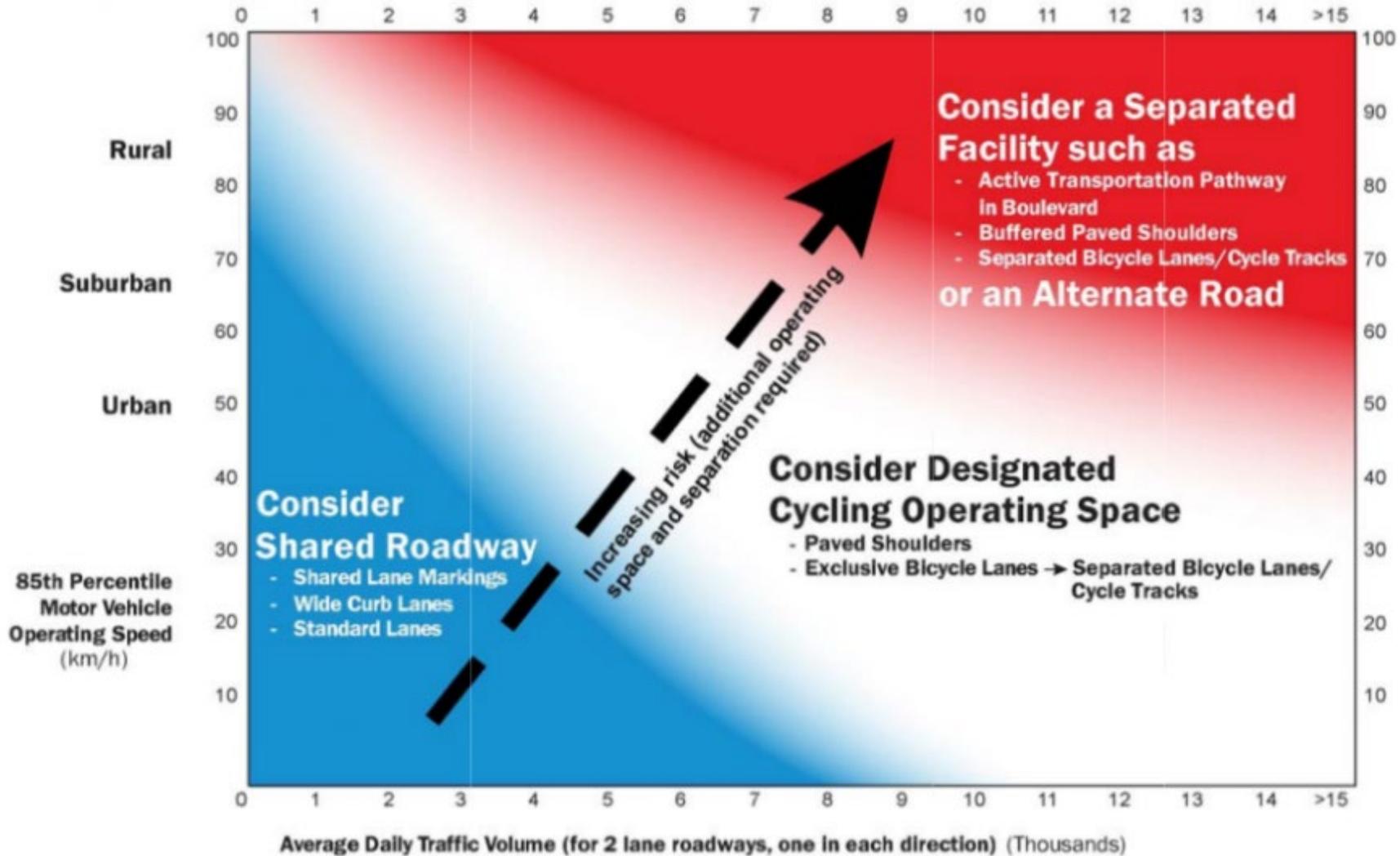
- Separated Bike Lane Pilot projects
 - Bike Facilities
 - Pilot Projects phases 1 and 2
 - Construction delivery and timeline
 - Public Works & Operations
 - Pilot Evaluation and Outreach
 - Discussion
- Separated Bikeways
 - Overview of Future Bikeways Plan



Bike Facility Selection



Desirable Bicycle Facility Pre-selection Nomograph





Bike Facility Selection



Separated Bike Lanes compared to other bicycle facility types

Least Separation



Signed Routes (No Pavement Markings)
A roadway designated as a preferred route for bicycles.



Shared Lane Markings
A shared roadway with pavement markings providing wayfinding guidance to bicyclists and alerting drivers that bicyclists are likely to be operating in mixed traffic.



On-Street Bike Lanes
An on-road bicycle facility designated by striping, signing, and pavement markings.



On-Street Buffered Bike Lanes
Bike lanes with a painted buffer increase lateral separation between bicyclists and motor vehicles.



Separated Bike Lanes
A separated bike lane is an exclusive facility for bicyclists that is located within or directly adjacent to the roadway and that is physically separated from motor vehicle traffic with a vertical element.



Off Street Trails / Sidepaths
Bicycle facilities physically separated from traffic, but intended for shared use by a variety of groups, including pedestrians, bicyclists, and joggers.

Most Separation



Separated Bike Lanes

Separated Bike Lanes – Protected Bike Lanes / Cycletracks

- Exclusive facility for bicycles
- Physically separated from vehicles
- One-way or Two-way
- Integration or separation at intersections
- More comfortable experience
- Important piece of network



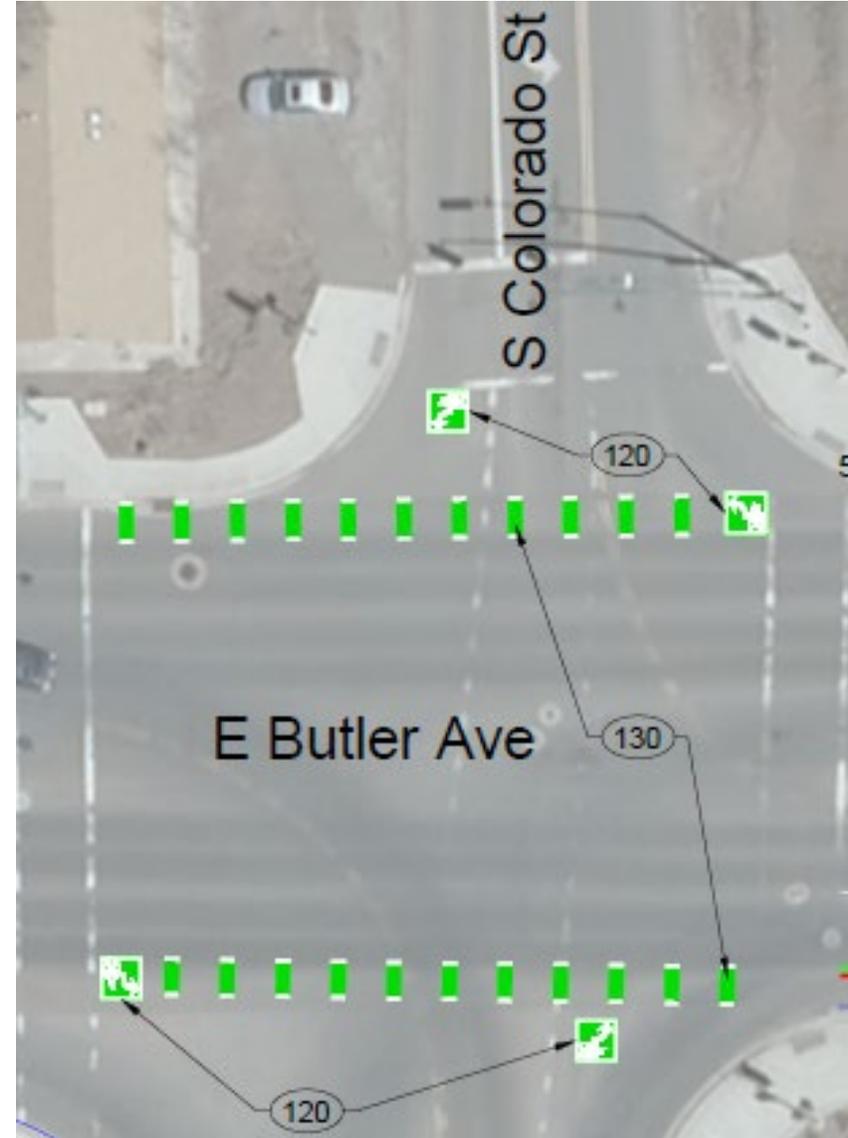


Butler Phase I Pilot Program

Pilot Separated Bike Lanes +

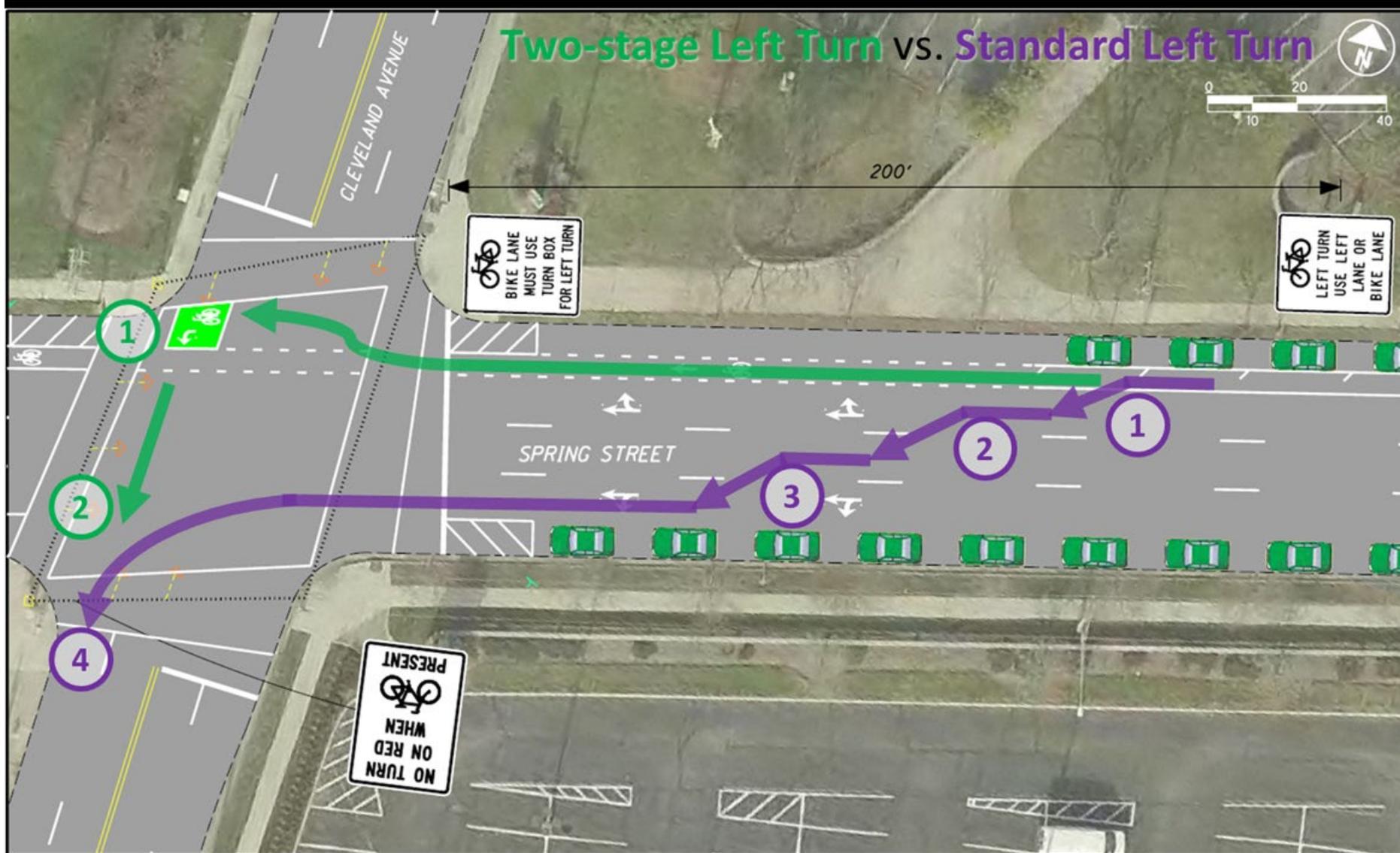
- Butler Avenue

- 0.9 miles in length
- Eastbound and Westbound
- Parking curb barrier
- Two-stage left boxes
- Intersection conflict zone markings
- Task Order signed with Eagle Mountain Construction in August





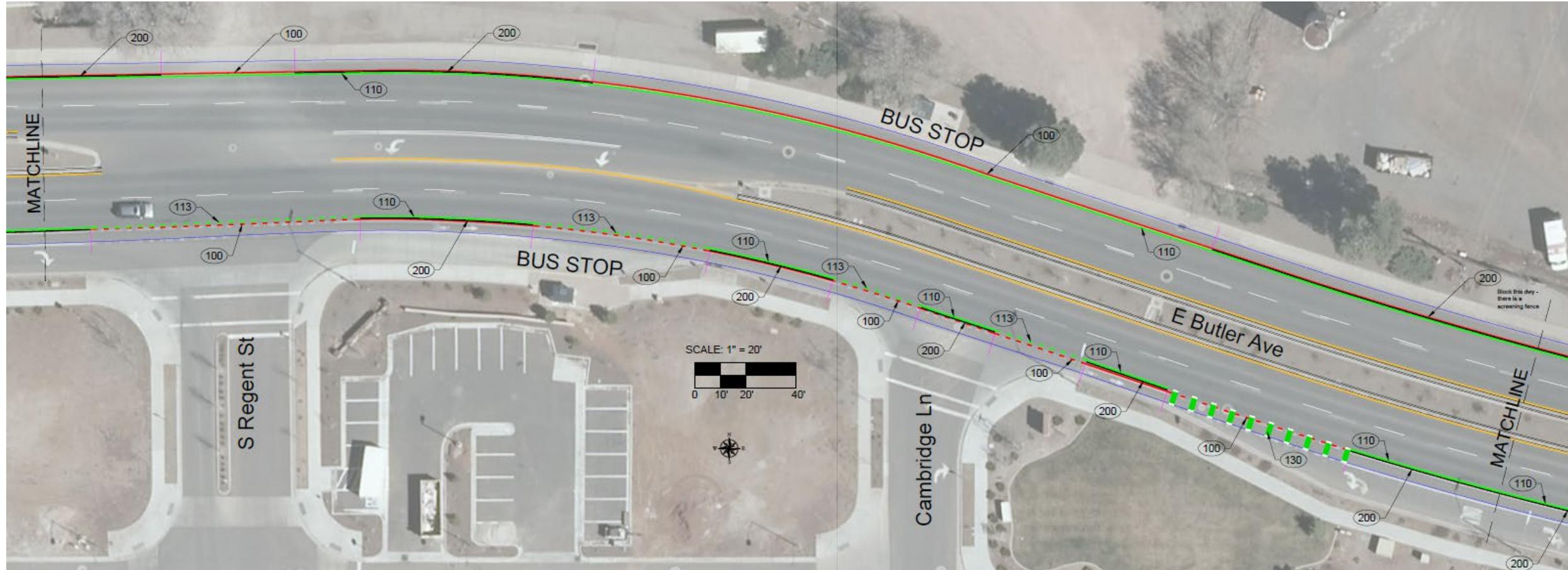
Two stage left boxes





Butler Phase I Pilot Program

Typical Block on Butler





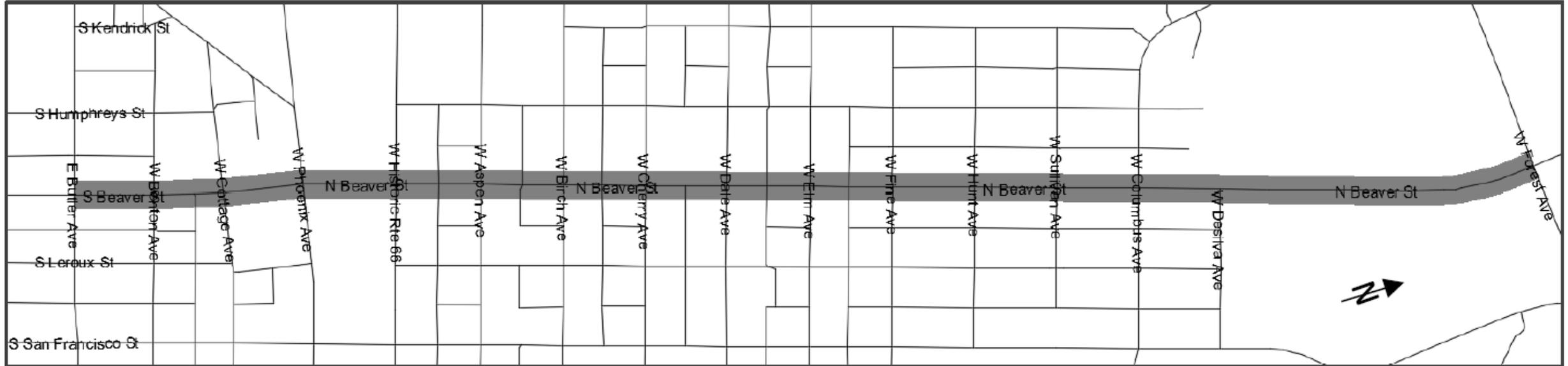
Pilot Project Status

Contract awarded to Eagle Mountain Construction

- Council direction received July 6th
- City internally developed concepts and completed design
- Project bid August 13th - 27th
- Task Order with Eagle Mountain Construction in early September
- \$ 538,650 for Butler Phase I
- Current Status
 - Materials ordered - 775 parking curbs is challenging
 - Scheduling sub-contractors – pavement obliteration and markings
 - Completion December 2021



Beaver Phase II Pilot Program





Beaver Phase II Pilot Program

Pilot Separated Bike Lanes +

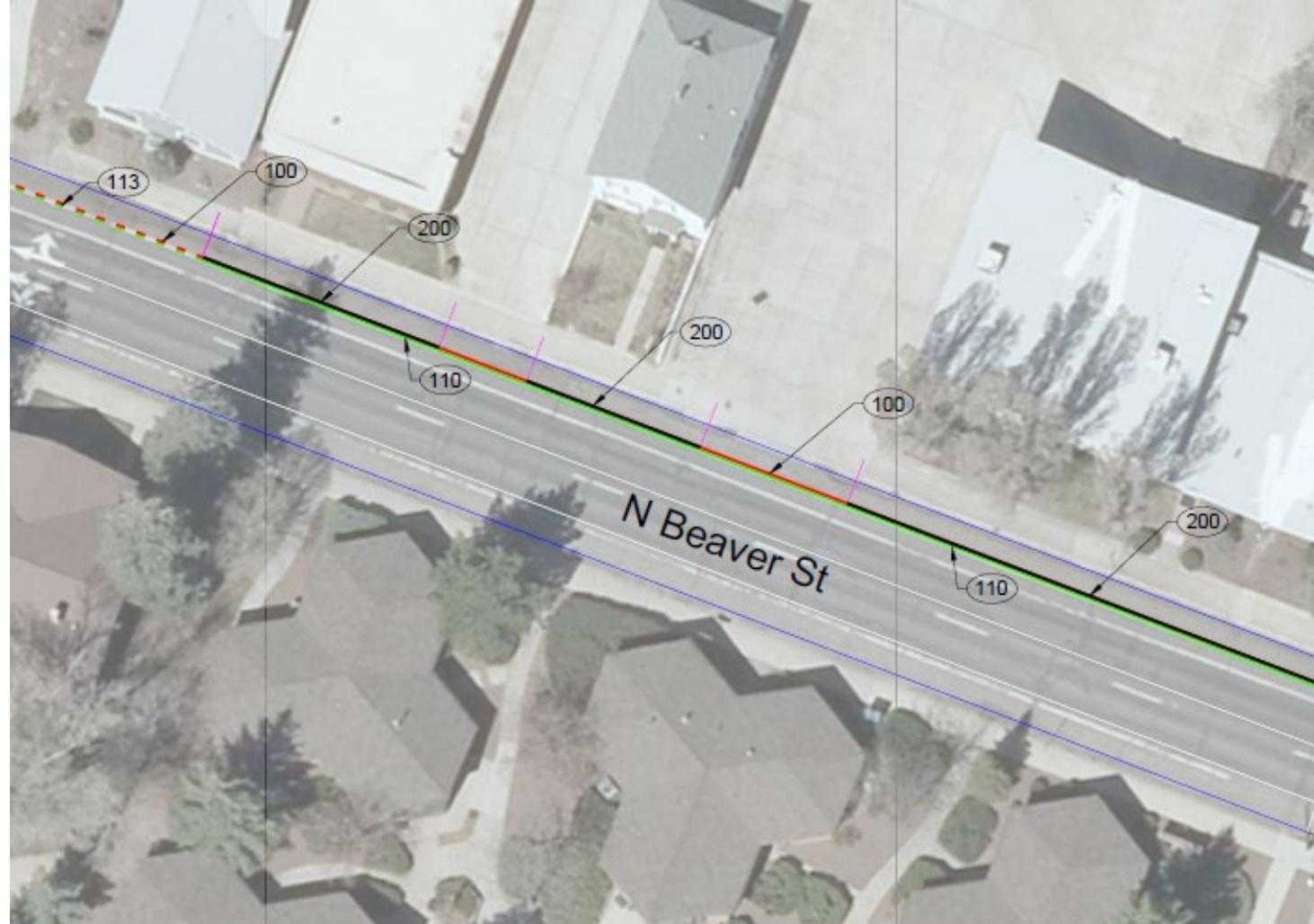
- Beaver Street
 - 1.2 miles in length
 - Two-way north of Columbus
 - One-way south of Columbus
 - Parking curb barrier
 - Two-stage left boxes
 - Intersection conflict zone markings





Beaver Phase II Pilot Program

Typical block between Cherry and Forest





Pilot Project Status

Contract awarded to Eagle Mountain Construction

- City internally developed concepts and completed design for phase I and then moved to phase II
- Phase II design completed September 15th
- Current Status
 - Eagle Mountain Construction Phase II cost proposal - \$350,000
 - Combined the Phase I and Phase II projects
 - Completion December 2021



Pilot Project Maintenance Operations

- Current snow operation in this area
- Proposed snow operation
- Proposed operational and one-time costs





Current Snow Operation





Current Snow Operation

Butler Ave and Beaver Street

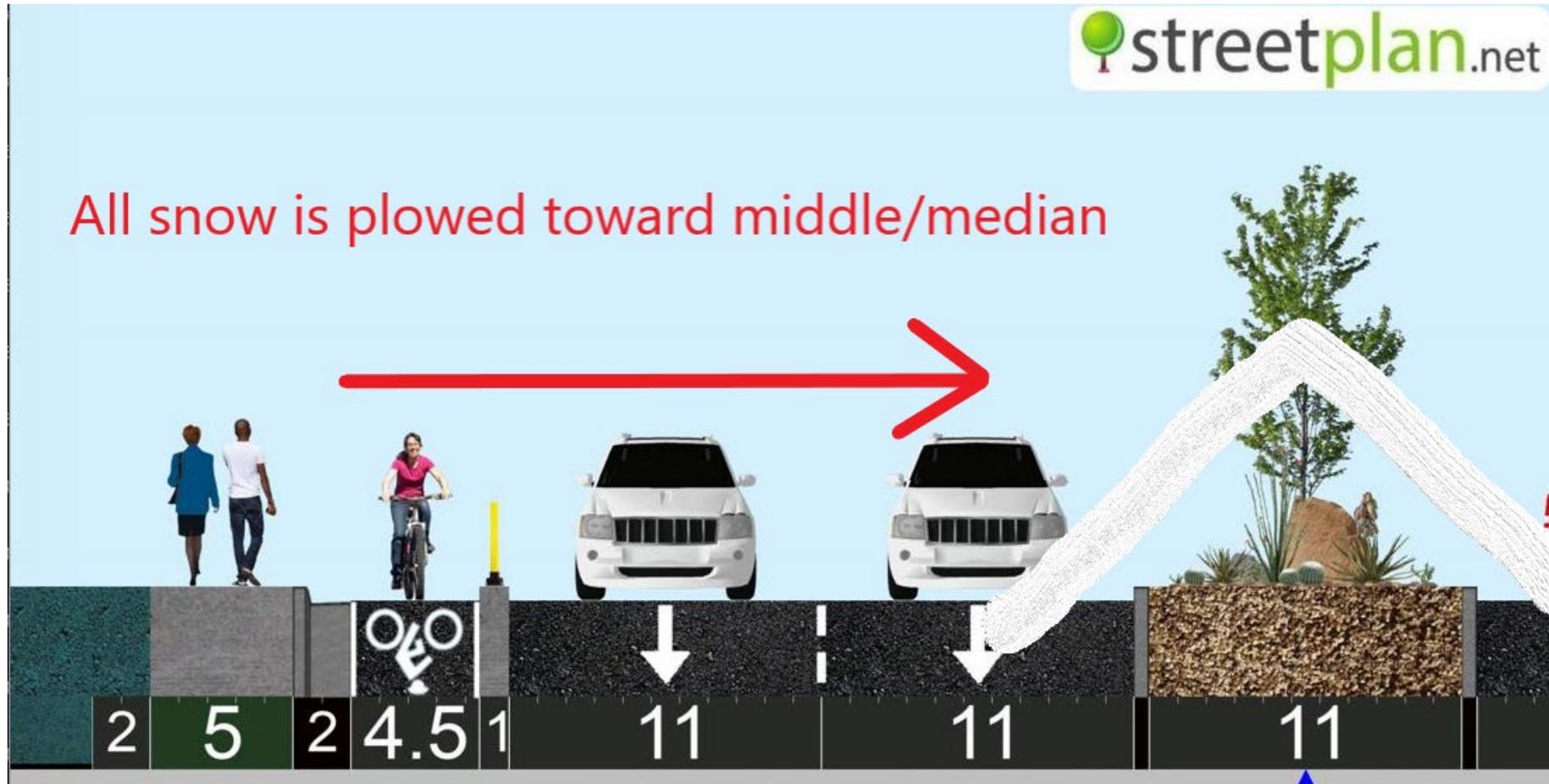
- Streets plow truck route coupled with other roadway routing totaling 25 lane miles
- No dedicated bicycle lane snow operation
- Snow is pushed toward the bicycle lane and adjacent sidewalk creating a windrow
- Ice cinders utilized for traction control as needed
- Differing storm event types



Proposed Snow Operation

Butler Ave Plow and Haul

- Proposal includes a high level of service
- Operational overview
- Pros and cons to operations





Proposed Snow Operation





Proposed Snow Operation





Proposed Snow Operation



Proposed Snow Operation

Beaver Street

- Similar strategy will be utilized comparable to Butler Ave
- Concerns and additional obstacles with two-way traffic turning into one-way, on-street parking, solid waste services
- Pros and cons of operation



Proposed Operational & One-Time Costs



- Highest/new level of service – dedicated equipment, staffing
- One-Time Equipment - \$650,000
 - Two Toolcats \$140,000 (\$70,000 each with attachments)
 - One Loader Blower attachment \$160,000
 - One Plow Truck \$350,000 (pilot to use existing fleet)
- Equipment operator labor, fuel - \$27,000 per 24-hour period
 - 12-hour day shift, 3 operators
 - 12-hour night shift, 9 operators
 - Moving the snow multiple times, hauling away
- Equipment availability, staffing, funding



Pilot Project Evaluation and Reporting

- Maintenance operation will require continuous evaluation and tweaking real time for best efficiencies and results
- Overall Pilot Program evaluation
 - Before and after bike counts
 - Before and after vehicle speed study
 - Survey to bicyclists on their experiences
 - Drainage concerns
 - Damage to barriers and delineators



Separated Bicycle Lane Infrastructure

Discussion

Separated bikeways

Outline...

- Bikeways plan summary
- Separation from traffic
- Bikeway facilities
- Prioritization
- Near-term separated bikeways
- Horizontally separated

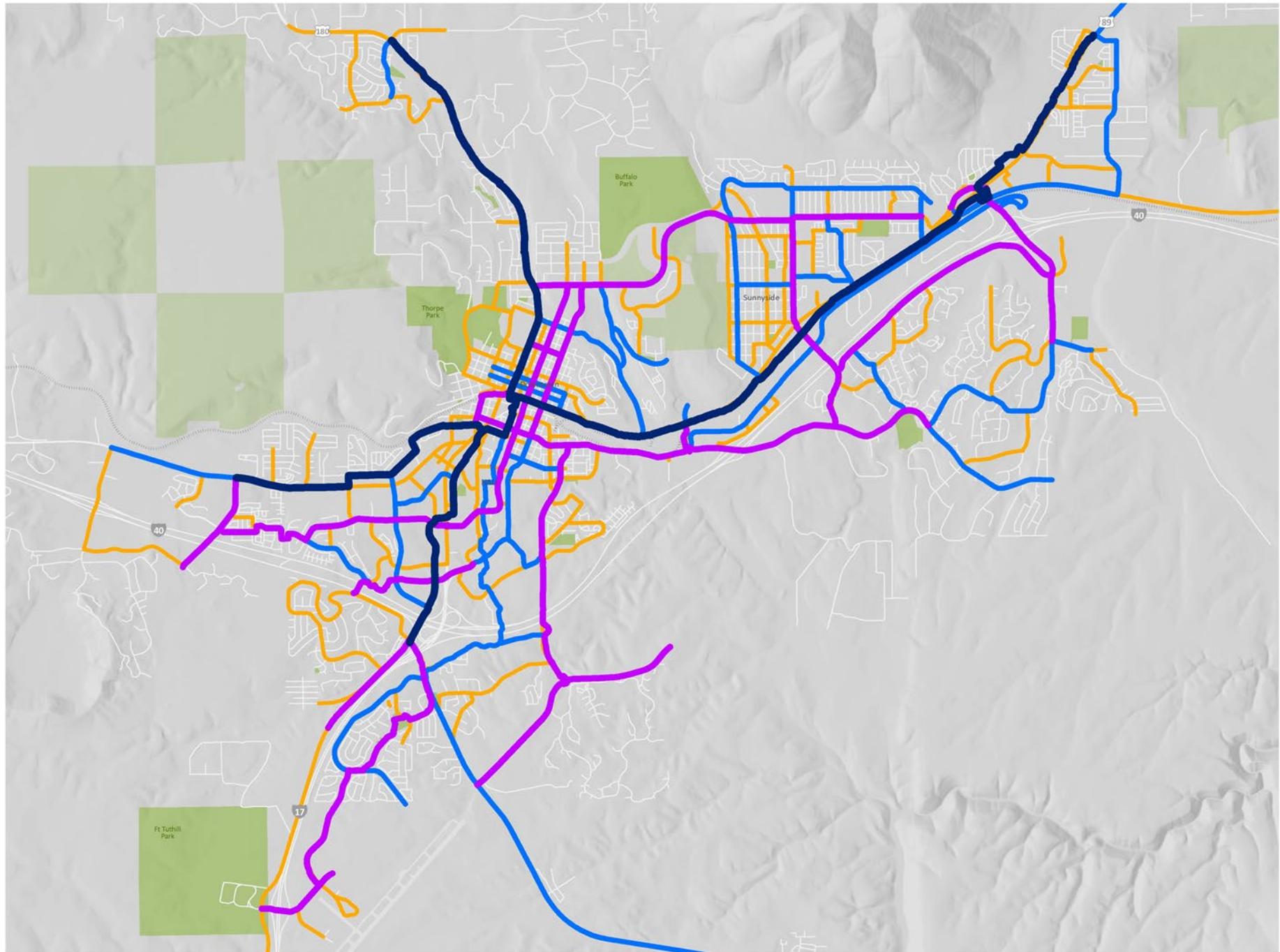


Bikeways plan

- Hierarchical, focus on primary and secondary bikeways
- Made up a variety of facilities
- Works best as a comprehensive system
- Signage, branding, and wayfinding help make the system cohesive
- Intended to appeal to “interested but concerned” segment of population



Active Transportation
Master Plan
**Bikeways
by hierarchy**



- Class**
-  1 Primary
 -  2 Secondary
 -  3 Third
 -  4 Fourth





Separation from traffic

- Bicyclists share space on low speed/volume streets
- Bike lanes provide dedicated space on moderate speed/volume
- Buffered bike lanes as speeds and volumes increase
- High speed/volume streets may require separation

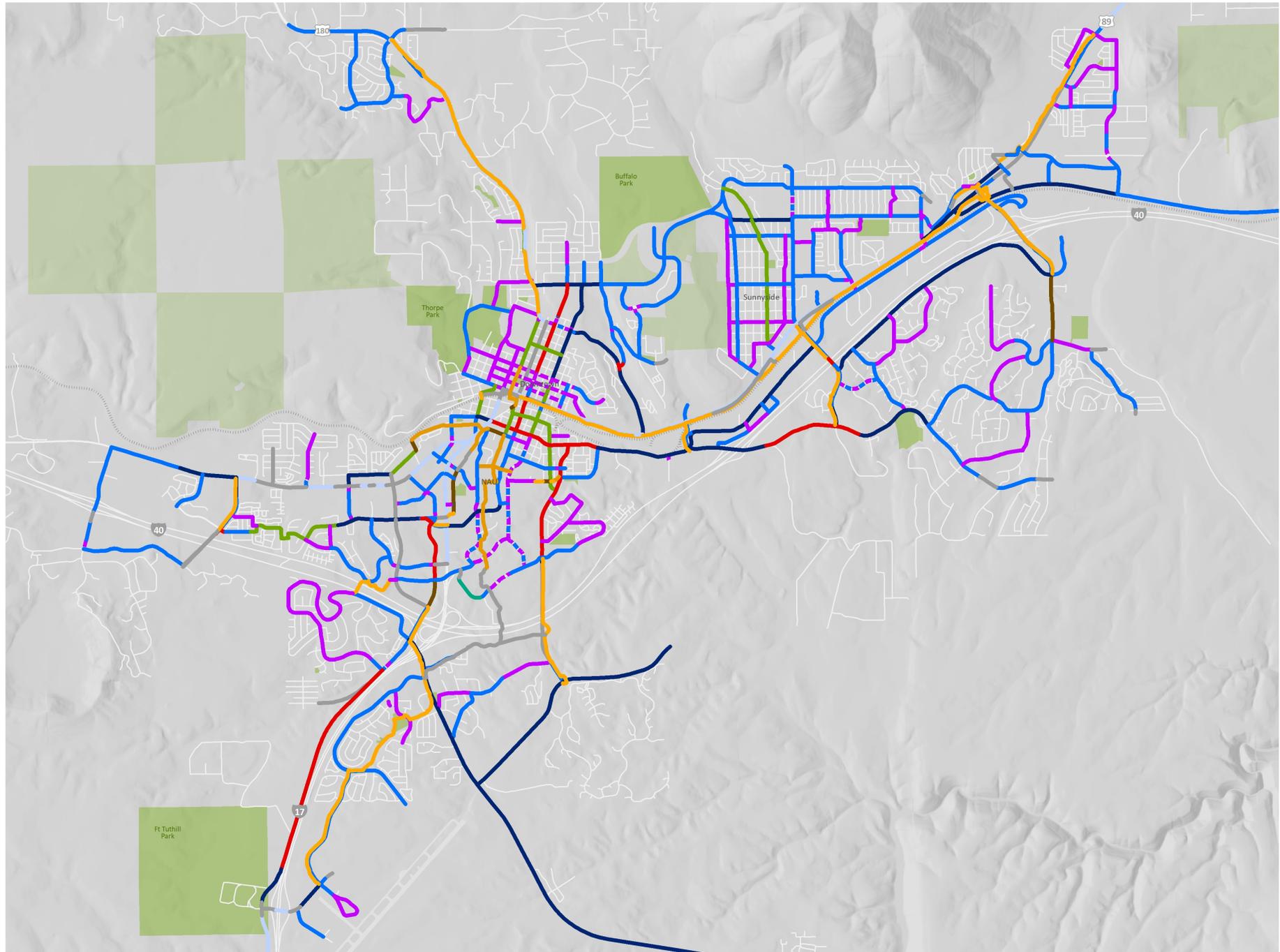


Bikeway facilities

Categorized by level of separation:

- **Shared streets:** low speed/low volume streets where bicyclists share the street with vehicles - route, boulevard, shared lane markings, advisory bike lanes
- **Dedicated facilities:** bikes have their own designated space within the roadway - bike lanes, buffered bike lanes
- **Separated facilities:** space for bicyclists is separated from traffic, either vertically by a physical barrier or horizontally by a buffer - vertical, horizontal, cycletrack, FUTS

Active Transportation
Master Plan
**Bikeways
by facility**



Facilities

-
- Bike lanes
- Boulevard
- Buffered
- Bus/bike lane
- Cycletrack
- Divided FULTS
- FULTS
- Route
- Separated
- SLM/bike lane
- Shared lane markings
- Shoulders



City of Flagstaff
September 2021



Bikeways prioritization



- Bikeways hierarchy – primary and secondary
- Reliance on other projects to complete segments
- Anticipated function and level of use
- Character of street and need for bikeway facilities



Intent within 5 years

- Complete primary and secondary bikeways as much as possible
- Include high-visibility, high-impact facilities, including separated
- Introduce other types of advanced facilities
- Implement bike lanes, bike routes, and other enhancements on third and fourth level bikeways
- Pull the network together with signing, identification, and wayfinding



Near-term separated bikeways

Pilot projects

- Butler Ave
- Beaver St

Bikeway projects

- Country Club Dr
- Mikes Pike
- Beulah Blvd

Roadway projects

- Lone Tree overpass
- East Butler Ave
- Beulah/University
- J.W. Powell Blvd

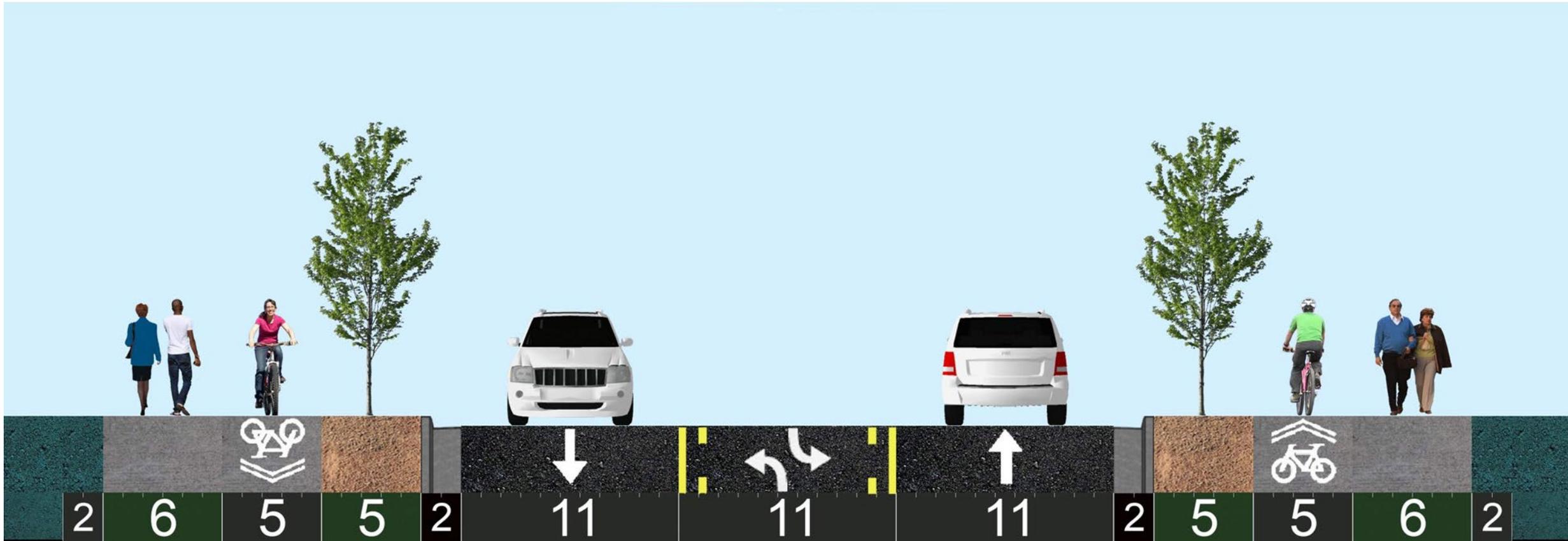
Capital projects

- Rio de Flag flood control
- Downtown Conn Center



Separated - horizontal

- Bike lane is separated from adjoining traffic lanes horizontally by parkway, buffer strip, or curb-and-gutter





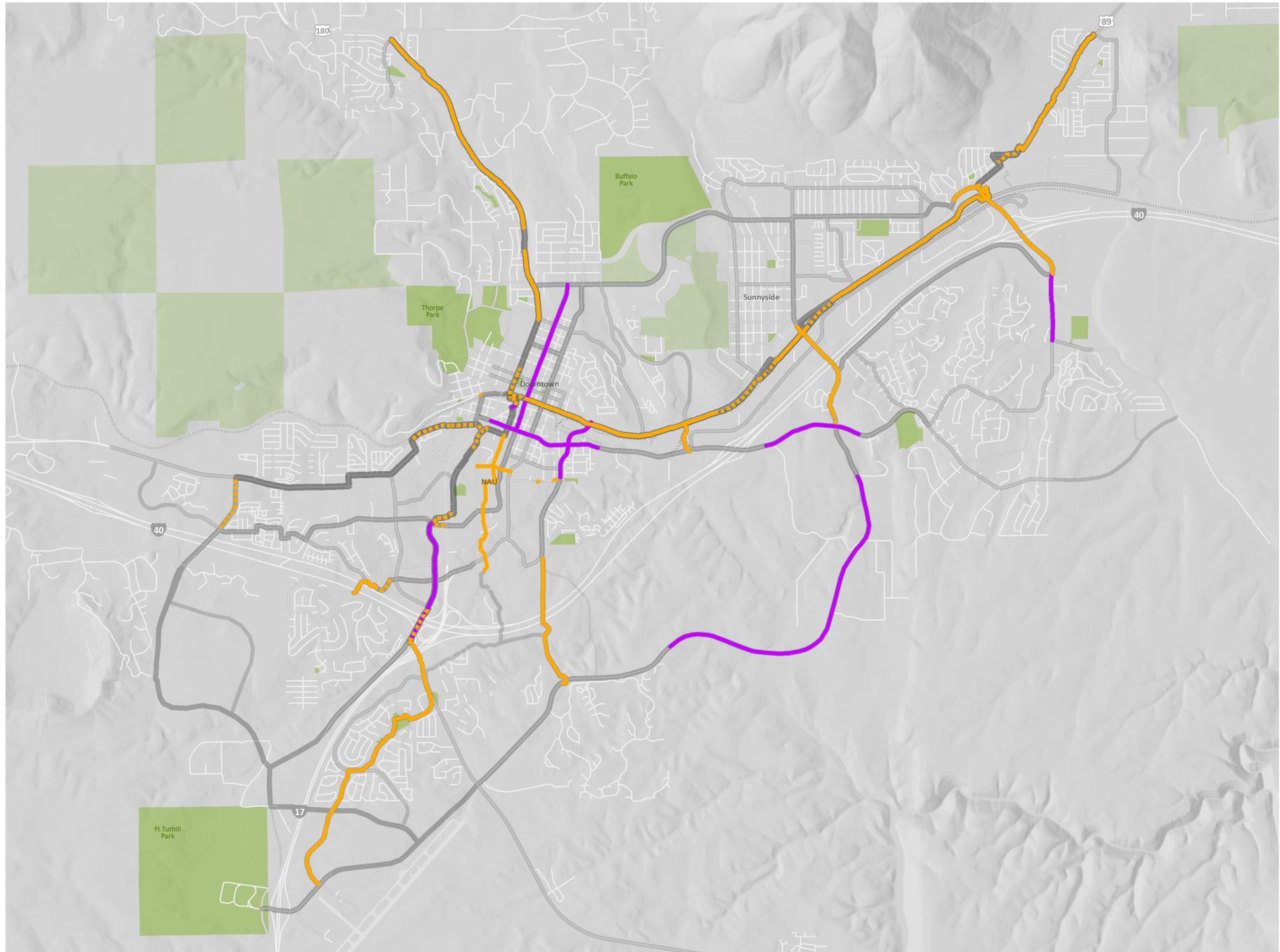
Separated - horizontal





Separated - horizontal

- Preferred configuration for separated bike lanes for new streets or construction
- Expensive to construct on existing streets
- Snow clearing and sweeping are same as FUTS trails
- Need clear differentiation between ped side and bike side
- May preclude cyclists from making left turns as a vehicle – need separated intersections, two-stage left boxes



Active Transportation
Master Plan
**Planned separated
bike lanes and FUTA**

- Existing FUTA
 - Planned FUTA
 - Separated
- Bikeway class**
- 1 Primary
 - 2 Secondary
 - 3 Third
 - 4 Fourth





Separated Bicycle Lane Infrastructure

Discussion

Public Safety Infrastructure





Emergency Radio Equipment



- Replacement and upgrades to the repeater towers on Mount Elden to keep frequencies in Dispatch and on the ground operational
- Replacement of all handheld and mobile radio units in Police, Fire and Public Works
- Units currently operational but are 10-years old with a 7-year recommended life span
- Unable to use full capabilities of equipment (i.e. Bluetooth) due to limitations of radios
- When a radio breaks or becomes damaged unable to find replacements

Total Estimated Cost - \$2.75M



Fire Apparatus – All Risk Operations



- All these units are over recommended life use (20 + years) as front-line units - City moved to 25-year replacement plan in 08' due to recession and have remained
- Quints have been out of service over 200 days in the past 3 years
- Building configurations and demand on our units continue to increase
- Unable to catch up with General Fund money allotted for Fleet
- 2-yr Needs – In priority order
 - 1- Quint - \$1.5M (23 yrs old)
 - 1- All risk pumpers - \$850k (21 yrs old)

Total Estimated Cost - \$2.35M



Fire Apparatus - Wildfire

- Similar extension to life expectancy as All-Risk Apparatus
- Wildfire risks continue to elevate in and around our community
- Do not meet safety requirements to be assigned to extended attack fires such as Rafael Fire
- Unable to catch up with General Fund money allotted for Fleet
- 2-yr Needs – In priority order
 - 2 - Wildfire engines - \$950k (21 yrs old)
 - 2- Water Tenders - \$850k (22 yrs old)

Total Estimated Cost - \$1.8M



Financial Considerations Public Safety





Financial Considerations

- Joint Equipment Needs \$2.75M
 - Replacement and upgrades to the repeater towers
 - Aging radio replacements
- Fire Apparatus Replacements \$4.15M
 - 1-Ladder apparatus/Quint
 - 1-All risk engine
 - 2-Wildfire engines
 - 2-Water tenders
- Current Joint Public Safety priority needs - \$ 6.90M



Financial Considerations

Type of Funding (no priority order)	Fire Apparatus Replacements (\$5.1M)	Joint Safety Equipment (\$1.8M)
General Fund Support/Pay as you Go – Budget process	Yes	Yes
Re-prioritize existing capital equipment and projects	Maybe some, but not enough	Maybe some, but not enough
General Obligation Bonds – Secondary Property Tax • Possible for November 2022 election	Yes	Yes
Debt Financing (Lease/Purchase) • Will need a repayment source, annual allocation/Gen Fund	Yes	Yes
Federal and/or State Funding	Yes	Yes
Sales Tax – Possible future election	Yes	Yes
User Fees • Not available for public safety	No	No
Development Fees – Growth related portion only • Items discussed are replacement items	No	No

Questions?

